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Forestry and the Environment: The Gambia Case Study

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Summary

In the late 1970s, USAID and the Government of The Gambia became increasingly concerned about the rate of loss of forest cover in The Gambia. Other Sahelian countries were undergoing massive environmental degradation due to the combined forces of drought, deforestation, and overgrazing. In The Gambia, pressure mounted to act before it was too late before the experience that was occurring in other nearby countries also occurred in The Gambia and deforestation became irreversible.

In 1979 fuelwood accounted for 75 percent of all wood used in The Gambia; at the same time, the country was able to meet only 25 percent of its lumber requirements from domestic production. Since fuelwood use was one of the principal factors underlying the destruction of forest cover, project designers focused on increasing the supply of wood products as the solution to the deforestation problem. Woodlots were seen as one way to increase fuelwood production, and plantations were seen as one way to increase both fuelwood production and timber production. USAID's involvement in the forestry sector in The Gambia has been modest both in the volume of financial commitments and the number of interventions. The principal activity supported in this sector was the Gambia Forestry Project (GFP), which was funded at $1.6 million between 1979 and 1986. The primary objective of the GFP was to improve the efficiency of wood production and utilization in The Gambia. This was to be accomplished by introducing improved technologies (Gmelina plantations and woodlots) to increase fuelwood and timber production and by introducing improved sawmills and woodstoves to increase the efficient use of forest products, thereby reducing the consumption of wood products.

The GFP failed to have any positive effect on the environment or on the adoption of environmentally sound forest management policies and practices. In contrast, the new USAID-supported Agricultural and Natural Resources (ANR) project ($22.5 million over 5 years), which was initiated in 1992, is likely to have a significant impact on The Gambia's environment and on the people of The Gambia who rely on the natural resource base for their livelihood.

Background

The vast majority of The Gambia's population depends directly on

the country's natural resource base for food, energy, and income. However, the natural resource base has been weakened and degraded over time as a result of population growth and a decline in rainfall.

Traditional resource management practices in The Gambia have not been effectively adapted to these two long-term trends. The result has been environmental degradation, which has had direct adverse economic consequences:

The decline in rainfall has allowed saltwater to intrude more extensively into the Gambia River valley, resulting in salinization of floodplain rice fields.

Salinization has reduced the available land on which to grow rice, thereby encouraging new lands to be cleared for agricultural production, thus resulting in deforestation.

Deforestation has resulted in massive runoff, soil erosion, and loss of biodiversity and soil fertility.

Loss of soil fertility has led to decreased crop yields and an expansion of crop area at the expense of the livestock sector.

Overgrazing and the displacement of livestock onto marginal lands have resulted in rangeland degradation as well as poor animal nutrition.

A four-person team conducted an assessment of the environmental impact of USAID-supported forestry activities in The Gambia during a 4-week period in October 1993, 7 years after the GFP ended in 1986. The team based its findings on a careful review of existing documentation, especially past evaluations; structured interviews with persons and organizations in The Gambia knowledgeable about USAID-supported programs in forestry; and perhaps most important, visits to 13 sites in all five administrative regions of the country to assess impact from the perspective of the intended beneficiaries.

USAID's Assistance Approach

USAID's involvement in the forestry sector has been modest. The principal activity supported by USAID in this sector was the GFP that began in 1979 and ended in 1986.

Funded at $1.6 million, the GFP introduced four technologies that were designed to slow and eventually reverse the depletion of the natural resource base. Two of the technologies were designed to increase the resource base: community woodlots to increase fuelwood production, and large-scale, industrial-type plantations to increase both fuelwood and timber production. The other two technologies were designed to reduce the consumption of wood products by increasing the efficiency of how forestry products were used: improved sawmills and woodstoves.

These technologies failed to produce any positive effect on the

adoption of environmentally sound forestry management practices. Consequently, they had little biophysical impact; they did not result in any significant improvement in the socioeconomic well-being of the people at the household level; and they did not generate significant economic benefits for the national economy. Few, if any, community woodlots attained the level of sustained production that had been anticipated. Similarly, the decision to destroy natural forests in order to establish plantations of exotic species did not result in a net improvement in the availability of wood products.

Findings

The technologies introduced under the GFP were inappropriate, both in terms of prescribing plantations within forest parks and of introducing community woodlots for fuelwood production. The cost of establishing plantations proved to be much higher than originally estimated due to the need to replant trees destroyed by drought, animals, and bush fires. Also, actual production of the trees turned out to be much lower than estimated, and management of the plantations, once established, was poor, further reducing the economic return from this intervention.

In addition, it is not clear that the establishment of a woodlot is the best use of arable land in The Gambia, given the undervaluation of natural resources in general and of fuelwood in particular. Population pressure, declining soil fertility, and growing demand for access to land for multiple and sometimes competing uses places a high premium on arable land.

Six additional factors help to explain why the technologies failed to have their expected impact.

The choice of species for both the plantations and the woodlots was inappropriate. Gmelina is a poor fuelwood species (because the firewood it produces burns too fast) and it is only a fair timber species.

The assumptions concerning the growth and survival rates of Gmelina seedlings were overly optimistic for the climatic conditions of The Gambia even in normal years, but especially from 1984 to 1986, which were among the worst drought years of the decade.

Community woodlots require substantial labor to plant (and maintain) seedlings labor which is also needed to plant food crops. Long-term forestry benefits could not compete with the short-term basic food needs that agricultural activities fulfill.

Although deforestation in The Gambia as a whole is increasing, there is still an ample supply of wood in the forests that people can cut and use for firewood. As a result, community woodlots, though an environmentally sound way to secure firewood, are not the only way to secure firewood.

Even fast growing species, such as Gmelina, normally require a decade before they can be coppiced and the timber used for poles or

sold commercially; thus, they provide a significant benefit only in the long term. (Although Gmelina trees can be pruned for firewood after only 2 years, this benefit is not considered significant.) Finally, the community woodlots were not designed to respond to the needs as perceived by the villagers (which was for fruit trees); rather, they were designed to respond to the needs as perceived by the donors and the Government (which was for firewood). As a result, when many of the Gmelina seedlings died after the first year because of drought, many communities replanted fruit trees and/or horticultural crops. They did not replant Gmelina seedings.

Program Implementation

Rural people are aware of the dangers of deforestation and the destruction of forest cover, partly because of public education provided by radio and extension communication. However, awareness and education, though effective in generating greater understanding of the risks of environmental degradation, have been less effective in changing behavior. Clearly they were not sufficient to prompt widespread adoption of resource protection and enhancement practices.

Institutional strengthening suffered because the training program was not implemented as planned. At the end of the GFP, one Gambian had received a B.S. degree (two had been planned); funding for the planned M.S. degree had been reprogrammed for specialized short-term training for one person at the diploma level; four agents had received diplomas from the Forestry Institute at Ibadan, Nigeria (five had been planned); and three persons (of five planned) had received technical training in sawmilling and logging.

The weak technical capabilities of the Forestry Department still existed as recently as 1992 when the new ANR project was designed. No woodlots visited by the evaluation team were successful in providing a sustainable source of fuelwood for community members. The few woodlots still in existence tended to be ones that had received assistance from a Peace Corps volunteer, Forest Scout, or nongovernmental organization (NGO). Most had not received such assistance. In fact, the need for forest management skills and long-term technical assistance had been greatly underestimated in the project design.

The experience of the GFP clearly demonstrates that local institutions and community involvement are necessary to halt and reverse the rate of natural resource degradation in The Gambia. This growing awareness has led USAID (and other donors) to support community resource management agreements designed to enhance community control over natural resources.

In the early 1980s, the Gambian Government was "groping in the dark" when it came to establishing an environmentally sound policy framework. For example, there were no disincentives to cutting firewood from the natural forest, because those who did so did not have to pay the true economic costs of the wood. At the same time, there were no strong incentives to participate in a community woodlot because of uncertainty about who controlled the products of

the woodlot. The lack of an appropriate economic policy framework or incentive structure clearly undermined the GFP. A major objective of the ANR project is to establish a policy and regulatory environment that is conducive to the adoption of improved natural resource management practices.

Thus, none of the four approaches generally associated with successful forestry programs worldwide was present in The Gambia. The technologies that were introduced were inappropriate for the country. Although various measures were supported to promote environmental awareness and education, the measures did not lead to changes in behavior. The importance of institutional development, and the technical assistance and training that is typically needed to strengthen institutions, were grossly underestimated. Finally, the policy environment, especially the economic incentive structure, was not conducive to forestry development.

Program Impact

The rate of adoption of forest resource management and use technologies that were introduced under the GFP was insignificant. All of the practices were either modified or discontinued by the end of the project. As a result, the impact of the project was negligible.

The plantations and woodlots were designed to increase the land area under forestry cover with species that would grow at a significantly faster rate than indigenous species, while the sawmill and woodstove interventions were designed to improve the efficiency of wood product use and to decrease the demands on the resource base. The two plantations established with USAID financing did not increase the amount of land under forest cover because the land first had to be cleared of forest cover to make way for the plantations. Although Gmelina trees were expected to grow at a faster rate than natural forested areas, there is no evidence that this occurred (given high failure levels because of drought) or that there was a net increase in biomass. Similarly, the net gain in forest cover and biomass production because of the establishment of community woodlots appeared to be insignificant. Most of the woodlots had been established on land that had been in crop production, and when the woodlot failed, the land was usually returned to its previous use.

Similarly, the technologies introduced under the GFP did not result in significant improvements in socioeconomic well-being nor did they generate significant economic benefits for the household or national economy. Ineffective management and unclear rules governing the distribution of benefits, especially for the community woodlots, were major problems. The determination of who was responsible for the long-term management of woodlots and who had authority to declare what could be harvested, how, and by whom was poorly understood. This was less serious when the only benefits were small branches and sticks obtained from pruning and general maintenance. But when the trees became tall enough to yield poles, large branches, and logs, there was a clear sense of economic value to be gained, and the distribution of these much larger benefits

became a much more serious issue.

Program Performance

The effectiveness of the GFP was undercut by the inappropriate choice of forestry technologies. Neither the plantation component nor the community woodlot component produced the results anticipated. As a result, The Gambia continues to face the depletion of forest cover and its attendant environmental consequences that prompted the design of the GFP in 1979. The dependence of both urban and rural populations on forested areas for firewood and other forest products has not diminished. Indeed, population growth and land pressure have combined to accentuate this dependence.

In addition, the program was not efficient. A 1985 evaluation estimated that the internal rate of return of the plantation component of the GFP was only 1.4 percent. The economic efficiency of the sawmill component was no better. The bolter sawmill was converting Gmelina logs into lumber at a cost that was four times the average price at which the lumber could be sold. Moreover, the sawmill was producing lumber at 62 percent below the target rate because fuel shortages allowed it to operate for only 2 days per week. To be profitable, the mill would have to operate at 16 times the estimated annual processing rate.

Most components of the GFP are not sustainable (financially or institutionally). Some of the USAID-supported woodlots have been sustained, but only with financing from other donors; none has become financially self-sufficient. The Government discontinued Gmelina plantations in 1985, but those that were established under the GFP continue to be managed by the Forestry Department. The Forestry Department was unable to maintain and operate the sawmill and still recover costs, and as a result the sawmill was privatized.

Against this backdrop, however, there is some cause for optimism. The recently initiated ANR project has been designed to encourage an appropriate policy environment for the forestry sector, train forest agents, increase revenue flows and revenue retention within the sector, and support community resource management agreements. Since this project is just now getting underway, it is too early to come to any conclusions regarding its impact on or contribution to the environment. However, the design of the project does reflect the substantial reorientation of USAID's strategy for natural resources management in The Gambia and for the forestry sector in particular.

Lessons Learned

The concept of community woodlots is seriously flawed in The Gambia. This concept is based on the underlying assumption that the community will work to establish and maintain woodlots, and then everyone will benefit during the course of pruning and harvesting. In practice, however, it is very difficult to implement this concept because the offtake from woodlots (unlike rice plots,

for example) is not easily divisible, and thus it is difficult to distribute the benefits equitably among community members. In addition, it is difficult to determine who is responsible for the management of community woodlots (or any common property, for that matter) and thus not clear who has authority to declare what can be harvested, how, and by whom.

Moreover, in The Gambia, the design of the community woodlot program (as distinct from its concept) was also fundamentally flawed. The technology that was introduced, planting fast growing Gmelina or eucalyptus trees, was inappropriate because the firewood produced burns too fast. A better technology would have been to plant hardwood trees that produce slow-burning firewood.

A new technology is more likely to be adopted if it places only minimal additional demands on labor, is easy to maintain, and requires few changes in existing practices. In The Gambia, the community woodlots satisfied none of these criteria. The demand for labor to plant seedlings competes with the demand for labor to plant food crops; seedlings are not easy to maintain; and new husbandry practices must be learned.

Collective action is most effective when there is a clear linkage between peoples' participation in a common effort and the benefit that is derived from such participation. In The Gambia, most community woodlots are not well maintained by the community, largely because this linkage is not clear and because there is uncertainty about the distribution of benefits. Maintenance of community woodlots seemed to be somewhat more effective when the community or ethnic group was unusually cohesive or when a Peace Corps volunteer or Forest Scout was present.

A new technology or practice is less likely to be adopted when the intended beneficiaries are able to meet their needs by using existing technologies or existing practices. Although deforestation in The Gambia as a whole is increasing, there are still ample supplies of wood in the forests that people can cut and use for firewood. As a result, community woodlots, though environmentally sound, were generally not successful because they did not meet a perceived need.

Technologies that yield significant benefits only in the medium to long term are less likely to be adopted than those that yield benefits more quickly. Even fast growing species, such as the Gmelina trees that were planted in community woodlots in The Gambia, normally require a decade before they can be coppiced and the timber used for poles or sold commercially. Although Gmelina trees can be pruned for firewood after only 2 years, this is not considered a significant benefit.

Technologies for which there is not a clear, expressed demand on the part of the intended beneficiaries are not likely to be adopted, or if adopted, not maintained. Community woodlots that were introduced in The Gambia were not designed to respond to the needs as perceived by the villagers (which was for fruit trees), but rather they were designed to respond to the needs as perceived

by donors and the Government (which was for firewood). As a result, many communities did not replant Gmelina seedlings (many of which had died after the first year because of drought), and instead replanted fruit trees and/or horticultural crops.

Strong institutions at the national level are crucial. In The Gambia, both USAID and Government support of the Forestry Department was insufficient. As a result, the Forestry Department was (and is) unable to promote the Government's objective of conserving The Gambia's forest resources through sustained management of these resources. Not only is it unable to provide technical advice at the local level, but also it is unable to enforce existing laws and regulations governing the use (or misuse) of forest resources.

This Evaluation Highlights was prepared by Donald G. McClelland of the Center for Development Information and Evaluation. It summarizes the findings from the USAID Working Paper "Forestry and the Environment: The Gambia Case Study," by Donald G. McClelland (USAID), Robert E. Hall (University of Arizona), Chris Seubert (Development Alternatives, Inc.), and Mary M. Young (Research Triangle Institute). The study is part of a six-country assessment of USAID's environmental programs. Readers can order copies of CDIE reports from the DISC, 1611 North Kent Street, Suite 200, Arlington, VA 22209-2111, telephone (703) 351-4006; fax (703) 351-4039.